

CLAIMS

1. A voice output apparatus comprising:
a text display unit operable to display a text message which is
information to be transmitted to a user; and

5 a voice output unit operable to output, via voice message, the
information to be transmitted, when a delay time passes, the delay
time being a time necessary for an action taken by the user to
visually identify a text message after the text message is displayed
by said text display unit.

10 2. The voice output apparatus according to Claim 1, further
comprising

a delay estimating unit operable to estimate the delay time
according to a display mode of the text message displayed by said
15 text display unit,

wherein said voice output unit is operable to output the
information transmitted via voice message, when the delay time
estimated by said delay estimating unit passes after the text
message is displayed by said text display unit.

20 3. The voice output apparatus according to Claim 2,
wherein said delay estimating unit is operable to estimate the
delay time so that the delay time includes a starting time which is
the time taken for a user's line of sight to start moving toward the
25 text message after the text message is displayed by said text display
unit.

4. The voice output apparatus according to Claim 3,
wherein said delay estimating unit is operable to estimate the
30 delay time so that the delay time further includes a moving time
which is the time taken for the user's line of sight to reach the text
message after the start of the movement.

5. The voice output apparatus according to Claim 4,
wherein said delay estimating unit is operable to estimate the
delay time so that the delay time further includes a focusing time
which is the time necessary for the user's line of sight to focus on the
5 text message after reaching the text message.

6. The voice output apparatus according to Claim 5, further
comprising

10 a personal information obtaining unit operable to obtain
personal information indicating a characteristic of the user,
wherein said delay estimating unit is operable to estimate the
delay time for each user based on personal information obtained by
said personal information obtaining unit.

15 7. The voice output apparatus according to Claim 6,
wherein said personal information obtaining unit is operable
to obtain the user's age as the personal information, and
said delay estimating unit is operable to estimate the delay
time for the user based on the age obtained by said personal
20 information obtaining unit.

8. The voice output apparatus according to Claim 6,
wherein said personal information obtaining unit is operable
to obtain, as the personal information, an eye-speed at which the
25 user's eyeballs move, and
said delay time estimating unit is operable to estimate the
delay time for the user based on the eye-speed obtained by said
personal information obtaining unit.

30 9. The voice output apparatus according to Claim 5, further
comprising:
an operating unit operable to allow said text display unit to

display the text message, and to allow said voice output unit to output a voice message, according to user's operation; and

a habituation specifying unit operable to specify a degree of habituation at which the user operates said operating unit,

5 wherein said delay time estimation unit is operable to estimate the delay time in accordance with the user's habituation, based on the degree of habituation specified by said habituation specifying unit.

10 10. The voice output apparatus according to Claim 9,
 wherein said habituation specifying unit is operable to specify, as the degree of habituation, a number of times the user operates said operating unit.

15 11. The voice output apparatus according to Claim 9,
 wherein said habituation specifying unit is operable to specify, as the degree of habituation, an operation time during which the user operates said operating unit.

20 12. The voice output apparatus according to Claim 5,
 wherein said delay estimating unit is operable to specify the focusing time based on a text display distance between a focal point and the text message displayed by said text display unit, the focal point being set on said voice output apparatus for attracting user's
25 attention.

 13. The voice output apparatus according to Claim 12,
 wherein said delay estimating unit is operable to derive the text display distance based on positions of the focal point and the
30 text message respectively, and to specify the focusing time based on the text display distance.

14. The voice output apparatus according to Claim 12,
wherein said text display unit is operable to display an agent
as the focal point, and

said delay estimating unit is operable to derive the text
display distance using the agent as a starting point.

15. The voice output apparatus according to Claim 5,
wherein said delay estimating unit is operable to estimate the
delay time by use of sigmoid function.

16. The voice output apparatus according to Claim 4,
wherein said delay estimating unit is operable to specify the
moving time based on the text display distance between a focal
point and the text message displayed by said text display unit, the
focal point being set on said voice output apparatus for attracting
user's attention.

17. The voice output apparatus according to Claim 3,
wherein said delay estimating unit is operable to specify the
starting time based on the size of characters in the text displayed by
said text display unit.

18. The voice output apparatus according to Claim 3,
wherein said delay estimating unit is operable to specify the
starting time based on the text display distance between a focal
point and the text message displayed by said text display unit, the
focal point being set on said voice output apparatus for attracting
user's attention.

19. The voice output apparatus according to Claim 3,
wherein said delay estimating unit is operable to specify the
starting time based on a contrast between a focal point and the text

message displayed by said text display unit, the focal point being set on said voice output apparatus for attracting user's attention.

20. The voice output apparatus according to Claim 3,
5 wherein said text display unit is operable to display the text message by flashing characters in the text message, and
said delay estimating unit is operable to specify the starting time based on a degree of flashing characters in the text displayed by said text display unit.

10 21. The voice output apparatus according to Claim 2,
wherein said delay estimating unit is operable to estimate the delay time so that the delay time includes a moving time which is the time taken for a user's line of sight to reach the text message after
15 starting to move toward the text message.

22. The voice output apparatus according to Claim 2,
wherein said delay estimating unit is operable to estimate the delay time so that the delay time includes a focusing time which is
20 the time taken for a user's line of sight to focus on the text message after reaching the text message.

23. A voice output method by which an information processing apparatus outputs a voice message, said voice output method
25 comprising:

a text display step of displaying a text message which is information to be transmitted to a person; and

a voice output step of outputting, via voice message, the information to be transmitted, when a delay time passes, the delay
30 time being a time necessary for an action taken by a person to visually identify a text message after the text message is displayed in said text display step.

24. The voice output method according to Claim 23, further comprising

a delay estimation step of estimating the delay time according to a display mode of the text message displayed in said text display step,

wherein in said text display step, the information to be transmitted is outputted via voice message when the delay time estimated in said delay estimation step passes after the text message is displayed in said text display step.

25. The voice output method according to Claim 24,

wherein in said delay estimation step, the delay time is estimated so that the delay time includes a starting time which is the time taken for a user's line of sight to start moving toward the text message after the text message is displayed in said text display step.

26. The voice output method according to Claim 25,

wherein in said delay estimating step, the delay time is estimated so that the delay time further includes a moving time which is the time taken for the user's line of sight to reach the text message after the start of the movement.

27. The voice output method according to Claim 26,

wherein in said delay estimation step, the delay time is estimated so that the delay time further includes a focusing time which is the time taken for the user's line of sight to focus on the text message after reaching the text message.

28. A program for causing a computer to execute:

a text display step of displaying a text message which is information to be transmitted to a person; and

a voice output step of outputting, via voice message, the information to be transmitted, when a delay time passes, the delay time being a time necessary for an action taken by a person to visually identify a text message after the text message is displayed in said text display step.